

# RECORD

20

15

25

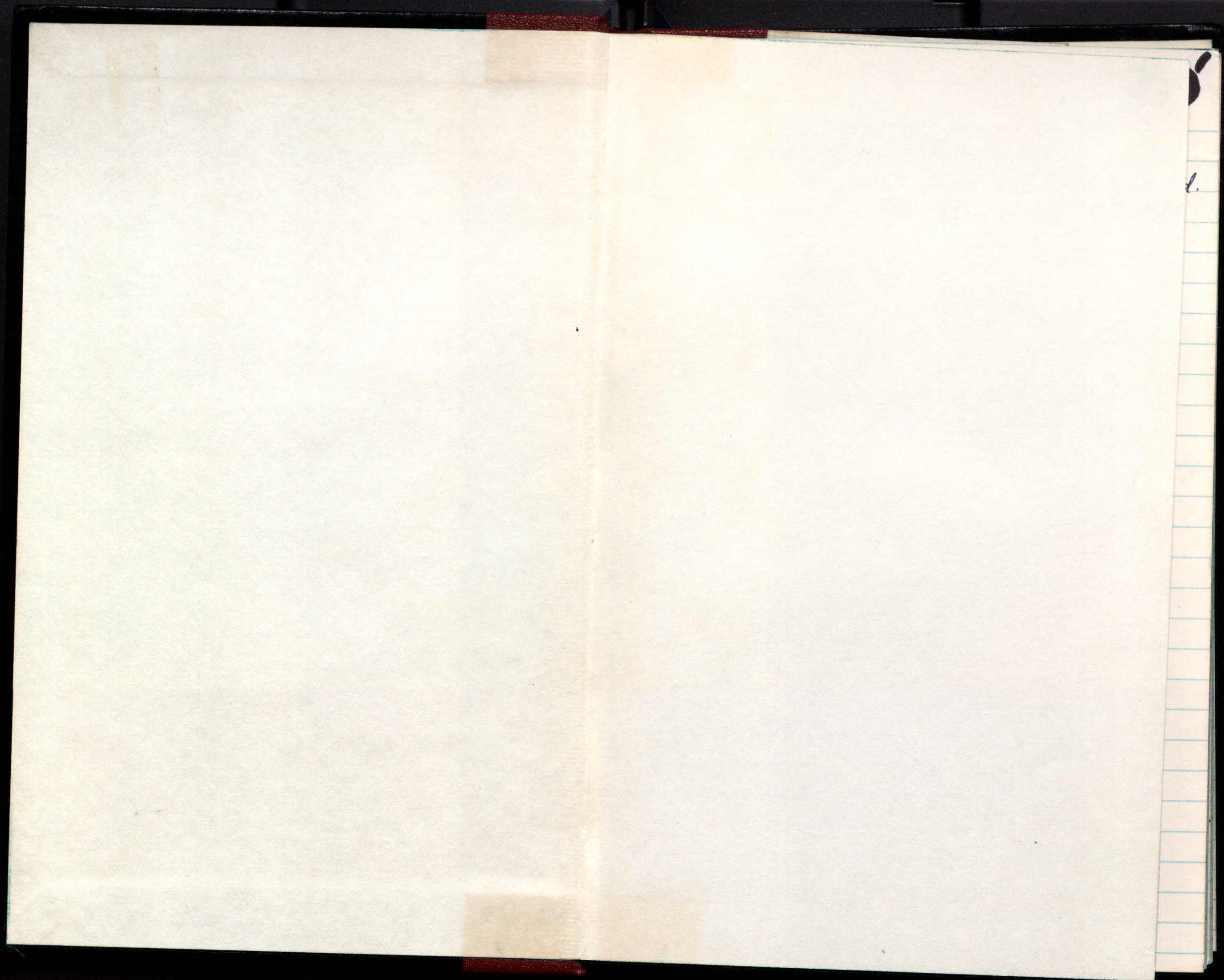
74

66

3.00

00







18 Sept. 1962 Material in Kott:

No mark = Portal-Rodes Rd.

Right Elytra clipped = 47971



19 Sept 1967

Parasite of trash-carrying lep. larva.

[T.E.]

~ 11:15 AM. ~~the~~ parasite emerged from larval lep. and commenced spinning ~ 1/2 hour afterwards.  
 "May have come out due to disturbance of larva."

[R.S.]

~ 1 PM - still spinning pupal case.  
 Case almost opaque, but ~~the~~ larva can be seen in silhouette, spinning.

~~All parasitized~~

20 sept

Three more acquired. All are from Solidago, henceforth to be known as Exp. No. 465-B



♂

♀

The fewb. I call:

ELEODES LONGICOLLIS

+

MARGINED THORAX + <sup>RUBROSE</sup> ELYTRA

1

ELEODES, BROWN BODIED

+

GREY-TOPPED

1

ELEODES, ROBUST

+

ELEODES, SHARP SPINED

+

FAT-REARED MIMIC

-

\*



31

33

32

GLANDS

♂

♀

LONG, 2 ch. ? narrowed

+

●

SHORT

1

+

1

~~BRACELET~~ SHAPED

+

MITTEN-SHAPED

+

1



Members of the black-aposematism-  
at-dusk complex:

- 1967 Eleodes longicollis  
 1967 E. ROBUST  
 1967 E. BROWN-BODIED  
 1967 E. SHARP-SPINED  
 1967 E. BLUNT-SPINED  
 1966 Monolema  
 1967 MELOID, RED & BLACK  
 1968 MELOID, BLACK  
 1967 Gonaspida  
 1966 Megasida  
 1967 HEMISPHERICAL TENEB.  
 1966 GIANT BLACK WEEVIL  
 1967 COMMON NON-SPRAYER  
 1967 Psoimachus  
 1967 Calozoma  
 1967 Black locust w/ red wings  
 1967 nymphal & adult Taeniopoda  
 1967 Rugose-elytra, margined teneb.  
 1967 Zopherus  
 1967 Grey-topped teneb, RUNNER  
 1966 Grey-topped teneb, FREEZER



21 Sept '67 Army ants (*Neivamyrmex*) versus  
Fluffpuffs

18:50

2 Fluffpuffs, naked and with fluff,  
~~enter~~ placed in nest. Naked one  
overrun and stung; immobile  
within 5 minutes.

20:00

Full fluffed fluffpuff still alive and  
moving.

20:05

Same experiment as above repeated.  
The ants are now looking for ways  
out, and are trying to climb the  
container walls, which they cannot.  
They also climb anything high and  
so climb rather than attack the  
fluffpuffs. But every once in a  
while an ant does bite. More  
ants climb atop the fluffpuffs  
and tip it over.

20:23

The naked one is on its back,  
stung and immobile. Both  
the fluffpuff in this expt and  
the one before are still alive  
& moving.



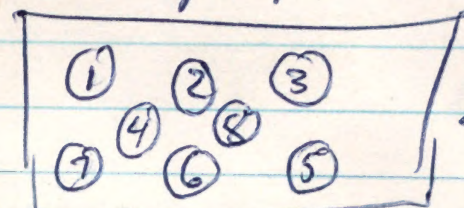
43

35

20 Sept 67

Chauliognathus propudus mimicry-complex  
on plant number

① Astartid    ② Sphecid    ③ Mutillid ♂    ④ Spider ♂  
⑤ Mutillid ♀    ⑥ Chauliogn.    ⑦ Spider ♀    ⑧ Spider ♀



← PIX.

1 } Portal-Rodero Rd 19 Sept  
2 }  
3 }

4 } Road to Paradise 20 Sept  
5 }

6 } Portal Rodero Rd. 19 Sept  
7 }

8 } Road to Paradise 20 Sept

Mating  
behav. in?

Photos with UV lens, distances.

(1) 1 cm.  
(2) 2 cm  
(3) 3 cm  
(4) 4 cm  
(5) 5 cm

~~1988~~



36

Exp. #465

Plants with trash carrying  
(ie, petal bearing) lep. larvae

#465-A

Portal-Rodeo Rd

#465-B

Solidago sp

Portal-Rodeo Rd

#465-C

Portal-Rodeo



37

37

PIOTRYN, A. W. 1910. L. 1.

104-68701-100-012

162 *Estuaries*

4.

9.1 (20.0%)

10

35

**E**

2

222

12

17

34

9.13

1

---

*Stelliois Torr.*  
 var. *Stelliois* *Stelliois*  
 no. 455, which also "small"  
 is another species of the  
*Stelliois* (Gray)

1. White (new) Biko  
 2. White (new) Biko  
 3. White (new) Biko  
 4. White (new) Biko  
 5. White (new) Biko  
 6. White (new) Biko  
 7. White (new) Biko  
 8. White (new) Biko  
 9. White (new) Biko  
 10. White (new) Biko



37

MONTAGNA 4301

TWA 19

37

PLANTS IDENTIFIED FOR T. EISNER BY WM. J. DRESS,  
P. A. HYYPIO, AND D. M. BATES. JANUARY, 1968

Plants are listed by experiment number. Where several numbers refer to the same specimen or species, the plant is identified under the first experiment number that refers to it. When the species appears later, the experiment number under which the name can be found is underlined, and is followed by all other experiment numbers that refer to the same plant.

Unless otherwise stated, all species are members of the family Compositae.

EXPERIMENT NUMBER(S)	NAME	DET. BY
462	<u>Gutierrezia Sarothrae</u> (Pursh) Britt & Rusby	WJD
463 =464, 465B, 493R2	<u>Hymenothrix Wislizenii</u> Gray	WJD
464 This experiment number refers to two separate plants:		
(1) =465G, 478	<u>Gutierrezia Sarothrae</u> (Pursh) Britt & Rusby	WJD
(2) =463, 465B, 493R2		
465 This is the series of desert composites: (V is not a composite)		
A	<u>Baileya pleniradiata</u> Harr. & Gray	WJD
B =463, 464, 493R2		
C =467B	<u>Verbesina encelioides</u> (Cav.) Benth. & Hook.	WJD
D =466, 467A, 477	<u>Viguiera dentata</u> (Cav.) Spreng.	WJD
E	<u>Heterotheca subaxillaris</u> (Lam.) Britt & Rusby	WJD
F =473	<u>Helianthus petiolaris</u> Nutt.	WJD
G =464(1)		
H	<u>Haplopappus gracilis</u> (Nutt.) Gray	WJD
I	<u>Parthenium incanum</u> HBK	WJD
J	<u>Bahia absinthifolia</u> Benth.	WJD
K	<u>Zinnia grandiflora</u> Nutt.	WJD
L	<u>Psilostrophe sparsiflora</u> (Gray) A. Nels.	WJD
M	<u>Zinnia acerosa</u> (DC.) A. Gray ( <u>Z. pumila</u> Gray)	WJD
N	<u>Sanvitalia Abertii</u> Gray	WJD
(O This number not used)		
P	<u>Dyssodia pentachaeta</u> (DC.) Robins.	WJD
Q =475F	<u>Senecio longilobus</u> Benth.	WJD
R	<u>Gaillardia pinnatifida</u> Torr.	WJD
S	<u>Thelesperma longipes</u> Gray	WJD
T	<u>Dyssodia acerosa</u> DC.	WJD
U	<u>Dyssodia Hartwegii</u> (Gray) Robinson	WJD
V	<u>Erysimum capitatum</u> (Dougl.) Greene (CRUCIFERAE) PA	
W	<u>Haplopappus laricifolius</u> Gray	WJD
X	<u>Berlandiera lyrata</u> Benth. var. <u>lyrata</u>	WJD
Y SPECIMEN HAS NOT BEEN LOCATED		
Z	<u>Pectis filipes</u> Harr. & Gray	WJD



+ cont'd  
↓

37

37

FE

PLANTS IDENTIFIED BY WM. J. DRESS, P. A. HYPIO,  
& D. M. BATES  
CONTINUED

EXPERIMENT NUMBER(S)	NAME	DET.
"Citronella weed" (No expt. no.)	<u>Pectis angustifolia</u> Torr. (This plant was from New Mexico. Note that plant # no. 465Z, which also "smelt like citronella" is another species of the same genus, <u>P. filipes</u> Harr. & Gray)	WJD
466 =465D, 467A, 477		
467 This is the series from Cave Creek Ranch:		
A =465D, 466, 477		
B =465C		
C =475G		
D	<u>Heliopsis parviflora</u> Gray	WJD
E	<u>Viguiera multiflora</u> (Nutt.) Blake	WJD
F =475A	<u>Viguiera multiflora</u> (Nutt.) Blake, variant with laciniate rays.	WJD
G	<u>Aster tephrodes</u> (Gray) Blake	WJD
H	<u>Bahia dissecta</u> (Gray) Britton	WJD
J	<u>Heterotheca subaxillaris</u> (Lam.) Britt & Rusby	WJD
	<u>Erigeron neomexicanus</u> Gray	WJD
473 =465F		
475 This is the series of Paradise 'composites' (not all composites):		
A =467F		
B (MALVACEAE)	<u>Sphaeralsea laxa</u> Worton & Standl.	DMB
C (VERBENACEAE)	<u>Verbena bipinnatifida</u> Nutt.	PAH
D (GERANIACEAE)	<u>Geranium cremophilum</u> Woot & Standl.	PAH
E	<u>Psilostrophe sparsiflora</u> (Gray) A. Nels.	WJD
F =465Q		
G =467C		
477 =465D, 466, 467A		
478 =464(1), 465G		
493R2 =463, 464(2), 465B		
493R3 #	<u>Baccharis glutinosa</u> Pers. (Male)	WJD



38

LABELS - ARIZ. 1967

W. WELLS: JOHN ANN  
CO., EASTON MICH  
OF BENTLEY'S  
IN SEPTEMBER 1957

U. S. DEPT. OF JUSTICE  
FEDERAL BUREAU OF INVESTIGATION  
WASHINGTON, D. C. 20535  
MAY 1 1967

100  
100  
100

J. O'Connell  
Kilgobbin  
No.

Issued 10  
000000



LABELS FOR ARIZONA FIELD TRIP, 1967(R. SILBERGLIED)  
(FOR T. EISNER)

ARIZ: Cochise Co.,  
Cave Creek Canyon  
(Cave Creek Ranch) 500  
September 1967

ARIZ: Cochise Co.,  
Cave Creek Canyon  
(Cave Creek Ranch) 100  
October 1967

ARIZ: Cochise Co.,  
road betw. Portal  
and Rodeo, N. Mex. 400  
September 1967

ARIZ: Cochise Co.,  
road betw. Portal  
and Paradise 200  
September 1967

ARIZ: Cochise Co.,  
road betw. Portal  
and San Simon 100  
September 1967

ARIZ: Cochise Co.,  
-----  
----- 1967 100  
R. Silberglied

at U.V. blacklite  
R. E. Silberglied 500

T. Eisner, J. Carrel  
and R. Silberglied 400  
collectors

TEXAS: Deaf Smith  
Co., near Glenrio  
15 September 1967 100  
T. Eisner, et al.

N. MEX.: Hidalgo  
Co., 2 mi. S. of  
Road Forks. 100  
16 Sept. 1967

TEXAS: Wheeler Co.  
Shamrock (at  
light) 14 Sep. 1967 200  
T. Eisner, et al.

N. MEX.: Dona Ana  
Co., eastern slope  
of SanAgustin Pass 100  
16 September 1967

N. MEX.: Dona Ana  
Co., top of San  
Agustin Pass, el. 200  
5654'. 3 Oct. 1967

T. Eisner  
Experiment  
No. 200

J. Carrel  
Experiment  
No. 400

J. Carrel  
collector 400



associated with Chrysopid Project

- ~~468~~ Sycamore 468 B
- ~~468~~ Chrysopid 468
- Reduviid <sup>with</sup> spots 468 A
- Tingido 468 C
- ~~468~~ Mantid 468 D
- Blue Reduviid 468 E
- Pogonomymex 468 F
- Spider (Anaphenid) 468 G

468 G. Spiders (anaphenids?) versus  
Phlepphuphphs (Chrysopid larvae)

21 Sept  
13:40

- (1) Spider versus full fluff. 3 ~~fluff~~  
fluffpuffs placed in low cassette with  
anaphenid on cut sycamore axil.
- (2) Spider versus defluffed. 3  
defluffed fluffpuffs placed in jar  
with anaphenid (?) on cut sycamore  
axil.
- (3) Same as #2, without leaf,



# CHAULIOGNATHUS COMPLEX

PREY:

Chaulio-  
gnathus    Amno-  
                  portal

PREDATOR:

Large Red "Sticky" Reduviid    +    +  
   20 Sept 3:45    21 Sept 11:00

464. Ch. association of Portal



21 Sept 1967 Anaphenid<sup>(?)</sup> spiders versus Phlyffpuffs

- 21:10 ① Spider with leaf nest cut to fit, put in cassette. 2 fluffpuffs with fluff placed in web. Spider came out when one of them moved; inspected fluff with palpi, movements with his legs. Then he returned to his tunnel nest in the palmate leaf base.
- 21:15 Repeated a second time.
- 21:16 Repeated a third. Now the second fluffpuff has crawled under the main sheet of the web. The spider is cutting a hole in the sheet surface. It puts its legs thru the hole to inspect the fluffpuff. Returns to upper sheet of web, inspects the larva<sup>(ie, the puff)</sup> caught there and then returns to its retreat (tunnel).
- 21:24 Returned to inspect<sup>upper larva</sup>, left in < 1 min.
- 21:29 Returns to puff ~~and~~ (upper) and remains there with legs atop the puff but not doing anything.
- 21:31 Bites puff and gets a chelicera full of fluff. Returns to retreat.
- 21:51 Spider returned to fluff as before, waiting



39

PE

with palps + legs on fluff. Returns to retreat after ~1 min.

22:35

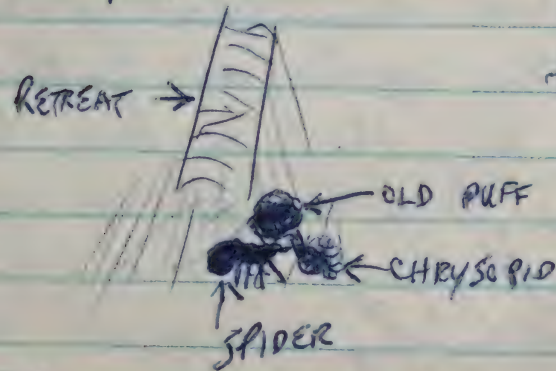
Still in retreat

2:37

Fluffpuff, which was caught by its fluff on the silk web has climbed out of its phuff and is standing on a strand of silk of the web, rebuilding its load with the old fluff.

2:46

Spider comes out of retreat. He is standing betw. the chrysoid, which is trying to reload, and the old pkg.



HE (the spider) is palpating both the old pkg and the anterior part of the reloading Chrysoid.

2:54

Spider now rests with its palps on the thorax of the chrysoid, which is ~~not~~ covered w/ fluff. I can not tell if the spiders cheliterae are on a chrysoid leg; they may be. The puff is about  $\frac{1}{3}$  covered w/ fluff, mostly on its abdomen.

3:02

Spider has leg and is feeding

3:14-3:15

4 photos taken, borrowed lens lamp  
1/5 sec @ f 5.6, 3.5, 2.9, 5.6

21 Sept

39

468 F

21:25

(2) Same as above expt, but with naked larvae dropped in web. Spider rushed out, tunnel was below main sheet. Spider cut hole in main sheet with legs, inspected larva rather closely w/ legs & palps, several times.

21:29

Spider has puff in cheliterae and drags it toward tunnel, thru to bottom of main sheet. Then returns to retreat, without puff. Returns to puff and holds it by the head in its cheliterae. Returns to retreat after 10 min.

21:31

21:51

Still in retreat. Puff still in web, does not move when prodded w/ forceps, and appears to have been sucked dry (appears as a flimsy skin of a larva).

22:35

Still in retreat

22:49

Returned to larva in web



PE

21 Sept

39

468 F

22:00 (3) Same as #1. spider + 2 fluff/puffs  
with fluff. This time, puffs just  
placed on leaf surface instead of  
in web. Vial used instead of  
cassette.

22:35

Nothing; spider still in retreat.



92

21 Sept

39

468

F

(4) Same as #3, using larvae in/out  
fluff. vial used instead of  
cassette.

22:00

22:35

Nothing; spider still in retreat.



PE

21 Sept

39

468 F

23:30:00 (5)

Naked larva dropped into web of Anaphenid (?) in vial, without legs. Larva moved web strands

23:30:05

Spider approached larva and touched with legs

23:30:20

Spider touched larva w palps

23:31:00

Spider bit larva w chelicerae

23:34:35

Still holding in same position.

2:15:15

larva just a skin, spider returned to refuge under silk.

2:17:00

Added a fluffpuff with snuff

2:18:00

~~Spider~~ can larva caught on silk by case

2:20:00

larva got off silk, wanders about



38

Q

39

23:36:35 Fluffy fluffpuff placed in vial w/ large  
andersonid (?) spider.

23:50:50 Nothing. Spider has moved about a  
few times but not attacked fluffpuff

2: 50:00 Nothing. fluffpuff is moving about  
rapidly, spider just sits there.



PE

22 Sept

(7)

12:45

Placed 2 spiders on cut leaves, with webs,  
in cassette, with three fluff/puffs, with  
fluff. ~~fluff~~ The 3 fluff/puffs were placed  
on the leaves, not in the webs, to  
see if they get caught in webs by them-  
selves.

39



98

39

21 Sept  
22:00

Whipscorpion (small, ~17 mm, not incl. whip)  
was placed in small round petri dish w/  
naked chrysid larva

22 Sept  
12:45

Naked <sup>larva</sup> dead on plastic bottom of petri dish,  
presumed eaten because of crumpled  
condition of skin.

12:50

Fully fluffed fluffpuff placed in cassette  
with same whipscorpion. Whipscorpion  
attacked fluffpuff 4 times, each time  
grabbing the moving fluff and pulling it  
in towards its chelicerae. Each time  
the puff was released.

23 Sept  
1:15

Remains of ~~fluff~~ fluffpuff's fluff found  
in cassette. Assumed fluffpuff was  
eaten.



PE

23 Sept

39

2:00

a crowded cassette of spiders started,  
including 2 cut leaves, with  
2 nest-building spiders, with  
abdominal pattern, and  
3 running spiders, yellowish-white

2:02

1 fluffy chrysopeid larva introduced  
and 1 naked chrysopeid larva introduced  
onto cover of cassette.

2:10

Naked larva has fallen off cover onto  
leaf surface with old web on it, and  
is not moving. Fluffy larva is ex-  
ploring top of cassette.



93

23 Sept

16:20

39

Examining leaves and nests of spiders under binoc. scope. Insects and other arthropods are found in nests of the marked spider (4) but the 2 nests of the running yellow spider that were examined are bare of all arthropods except exuviae of cicadellids and living cicadellids and mites.

Arthropods found in web nests of marked spider:

- Cecidomyiid flies
- Staphylinid beetles
- Mites
- Cicadellid bugs
- Tingid bugs
- Chalcidoid Hymenopis
- Trichogrammatid wasp
- Muscid flies
- Calliphorid fly



PE

40

26 Sept. 1912

k

p.

m

N

/



# 40

A

B

C

D

E = Small Dandelion-like head, upright shoot

F = sunflower

G = Chauliognathus flower

Pix TAKEN IN FIELD: U.V.

H = Ground-hugging dandelion-like.

26 Sept. 1967

last 5  
pictures  
on a roll

(1) 467 B = 465 C

f = 5.6

distance 5'

(2) 465 I Hymenoptera bush

5.6

4'

(3) 465 J Yellow Desert Aster

5.6

4½'

(4) 465 K Purple Heart

5.6

2'

(5) 465 L Yellow Heart

5.6

3'

New roll

(1) 465 D = ~~467~~ A

4

4'

1st 6

(2) 465 D = ~~467~~ A

~~5.6~~

4'

pictures

(3) 465 M White purple heart

5.6

2'

(4) 465 N Green 3-horned ~~+~~ Chauliognathus bush

5.6

2'

(5) 465 N Green 3-horned

5.6

4'

Letter  
"O" skipped →

(6) 465 P Yellow Dingleberry

8

1.8'

(6) was also shot in color, f16 @ 1.8' (knife in picture)



23 Sept

SPIDERS vs. CHRYSOPID LARVAE

12:30

Eight cassettes set up, as follows.

39

CHRYSOPID LARVA

1	leaf web	WEB- SPINNING SPIDER	2	WITH fluff
2	leaf web		2	WITH FLUFF
3	leaf web		2	NO fluff
4	leaf web		2	NO fluff
5	no leaf web	RUNNING SPIDER	1	WITH FLUFF
6	no leaf web		1	NO FLUFF
7	no leaf web		1	WITH FLUFF
8	no leaf web		1	NO FLUFF

~~All spiders~~ All web

Spiders 1-4, collected at Cave Cr. Ranch

23 Sept 1967 about noon, on Sycamore

Spiders 5-8, collected at Cave Cr. Ranch

22 Sept 1967 on Sycamore

Natural prey seen in webs includes:

web #	prey
1	1 muscid fly
2	1 homopt. nymph.
3	1 chalcid fly
4	2 muscid flies + 2 cecidomyiids

all above nests had evidence of fluff.



23 Sept

PE

22:30

LEAF NESTER, WITH LEAF NEST,  
VS. 2 FLUFFY LARVAE  
START

24 Sept

11:20

Both larvae alive, with full fluff;  
Spider still in nest.

19:35

One larva in web has pupated.  
The other larva is under some  
strands ~~and~~ of the web and is  
apparently trapped. The spider  
shows no interest and is in its retreat.

25 Sept

16:57

Same as before; trapped larva has freed  
itself and left some fluff in the web.

26 Sept

13:22

Same as 25 Sept. Spider in retreat, one  
larva free and moving, other in web  
as pupa.

21:53

Same as last time, except spider has  
left retreat.

27 Sept

12:36

Same as before. Spider in retreat

~~28 Sept.~~

29 Sept

00:59

Spider left retreat; spun on other side of  
leaf; larva still alive but left more fluff  
in fresh strands.

2 OCT

3:35

Spider in retreat; Both larvae have  
pupated. TERMINATED

23 Sept

(2)

22:30

LEAF NESTER, WITH LEAF NEST,  
VS. 2 FLUFFY LARVAE  
START

39

24 Sept

11:21

One larva caught by fluff on underside  
of web in silk of web. The other has  
apparently lost some fluff to silk strands  
on the edge of the web, where it  
is standing and struggling against  
one silk strand that is loose from  
the web where the leaf was cut.

Spider still in retreat of web

19:37

Spider still in retreat; both larvae  
are free and moving.

25 Sept

17:00

Both larvae alive + moving. One has  
lost some fluff. Spider has left  
retreat and hides under leaf, but not  
near larva.

26 Sept

13:23

Same as 25 Sept. Both alive and moving.  
Spider has new web between cassette + leaf.  
One fluffpuff was observed to cut spider silk  
thread <sup>(with mandibles)</sup> that held it restrained.

21:54

One larva is on side of cassette, alive +  
moving; other is on surface of web,  
also alive. Spider is on web, not in retreat

27 Sept

12:38

Spider not in retreat, but on side of cassette one larva  
alive + moving; other dead on other side of leaf, apparently  
pucked dry, probably by 1st larva.



23 Sept

(3)

LEAF NESTER, WITH LEAF NEST, VS  
2 NAKED LARVAE

22:30

START

22:32

LARVA WANDERED INTO WEB AND  
SPIDER REACTED BY ATTACKING IT  
WITH ITS LEGS AND PALPI  
WAVING FURIOUSLY. LARVA CONTINUED  
TO STRUGGLE IN WEB AS SPIDER  
PALPATED IT. SPIDER SUDDENLY  
RETURNED TO WEB RETREAT.

24 Sept

12:31

One larva found dead on bottom of  
cassette. No silk on it, apparently  
sucked dry. Other larva half dressed.  
(removed the fluff.)

19:40

Same as before. I removed some fluff  
the larva had accumulated.

25 Sept

17:32

Same as before. (removed some fluff the  
larva had accumulated.)

26 Sept.

13:28

Same as 25 Sept. Fluff removed

21:55

Same as above. Dead chrysoid 3 now  
incorporated into fluff of live one.  
Fluff and chrysoid <sup>skin</sup> now removed so  
larva is now naked. Spider in retreat.

27 Sept

12:41

Same as before. Fluff removed.

29 Sept 1:00

Same as before. Fluff removed. Spider out of  
retreat.

2 OCT 3:38

Same as before, but larva pupated.

23 Sept

(4)

LEAF NESTER, WITH LEAF NEST,  
VS 2 NAKED LARVAE

39

22:30

START

24 Sept

12:33

Both larvae alive and partly redressed.  
I have just removed their fluff again.  
Spider still in retreat.

19:43

Both larvae alive ~~and~~ but sluggish.  
Spider still in retreat.

25 Sept

17:06

One larva alive and I removed some  
fluff it had accumulated. Other  
is in web and is dead and  
black. (examined by T. E. Brier) <sup>(NOT EATEN)</sup>

26 Sept

13:29

Same as 25 Sept. Fluff removed.

21:59

Same as above. Fluff removed.

27 Sept

12:44

Same as before, except larva inactive  
and appears ready to pupate.

29 Sept 1:01

Spider out of retreat, new web strands on  
side of cassette. Other larva dead; apparently  
NOT sucked dry. TERMINATED



23 Sept

(5)

22:30

LEAF NESTER, WITHOUT WEB,  
VS. FLUFFY LARVA

START

24 Sept

11:45

Fluffpuff caught by fluff in webbing and is suspended in midair.

12:38

Some of fluff has been lost to another strand of silk in web. Spider still spun in against side of cassette.

19:45

Larva is caught in web but very sluggish; appears ready to pupate. Spider uninterested and in retreat.

25 Sept

17:08

Fluff still in web. Spider still in retreat. Larva is now naked, and is caught in another part of web, alive. (Examined by T. Eisner)

26 Sept

13:31

Fluff still in web, larva is now dead, in same part of web as before, apparently sucked out. Spider in retreat. TERMINATED

(2), CONTINUED.

29 Sept; 00:59

SPIDER NOT IN RETREAT; NEW WEB ON SIDE OF CASSETTE. LARVA ALIVE UNDER NEW STRANDS AND HAS LOST SOME FLUFF IN NEW WEB.

2 OCT. 3:35

SPIDER IN NEW WEB. LARVA IN WEB DEAD, APPARENTLY SUCKED DRY. TERMINATED

23 Sept

(6)

22:30

LEAF NESTER, WITHOUT WEB,  
VS. ~~FLUFFY~~ NAKED LARVA

START

24 Sept

12:41

Larva alive and quiet on bottom of cassette. Spider against side of cassette, not near larva.

19:46

Same as before. ~~Sp~~ Larva seems to have some silk attached to it.

25 Sept.

17:10

Larva dead in web, black and apparently sucked dry. TERMINATED

39



23 Sept

(7)

RUNNING SPIDER VS FLUFFY LARVA  
(NO LEAF)

22:30

START

24 Sept

~~22:30~~ 11:45

Larva is suspended in midair directly below where spider has spun its retreat. It has lost much fluff in web, and even more below itself on bottom of cassette.

12:44

Larva has lost more fluff to bottom of cassette. It is pulling fluff off its back with great effort, dropping it below itself in a pile.

13:05

Pictures taken, web broken. Spider taken out. Webbing with larva hung on side of cassette. It now is upside down and has a foot-hold on the silk.

13:19

Larva has released itself. Spider replaced.

19:47

Larva suspended in midair by fluff. Spider active but not near the alive & struggling larva. Larva is pulling out fluff, as before.

25 Sept

17:12

Larva is dead but apparently not sucked dry (appears rather solid, T. Eisner). Still suspended by fluff in midair. (examined by T. Eisner)

TERMINATED

23 Sept

(8)

RUNNING SPIDER VS NAKED LARVA  
(NO LEAF)

39

22:30

START

24 Sept

12:56

Larva has somehow managed to get itself suspended in midair by several strands of silk of the web. It is upside down and struggling to cut threads of the web with its mandibles. Spider is spun in retreat on side of cassette.

13:10

Photos taken, web broken. Larva is still caught in silk, but is on threads suspended from cassette top while being upside down on the bottom of the cassette.

19:49

Larva stuck to silk on bottom of cassette. Spider active but not interested.

25 Sept

17:30

Spider is in retreat; larva as before, appears ready to pupate (examined by T. Eisner)

26 Sept

13:35

As before (25 Sept).

TERMINATED

exp. continued on p. 40

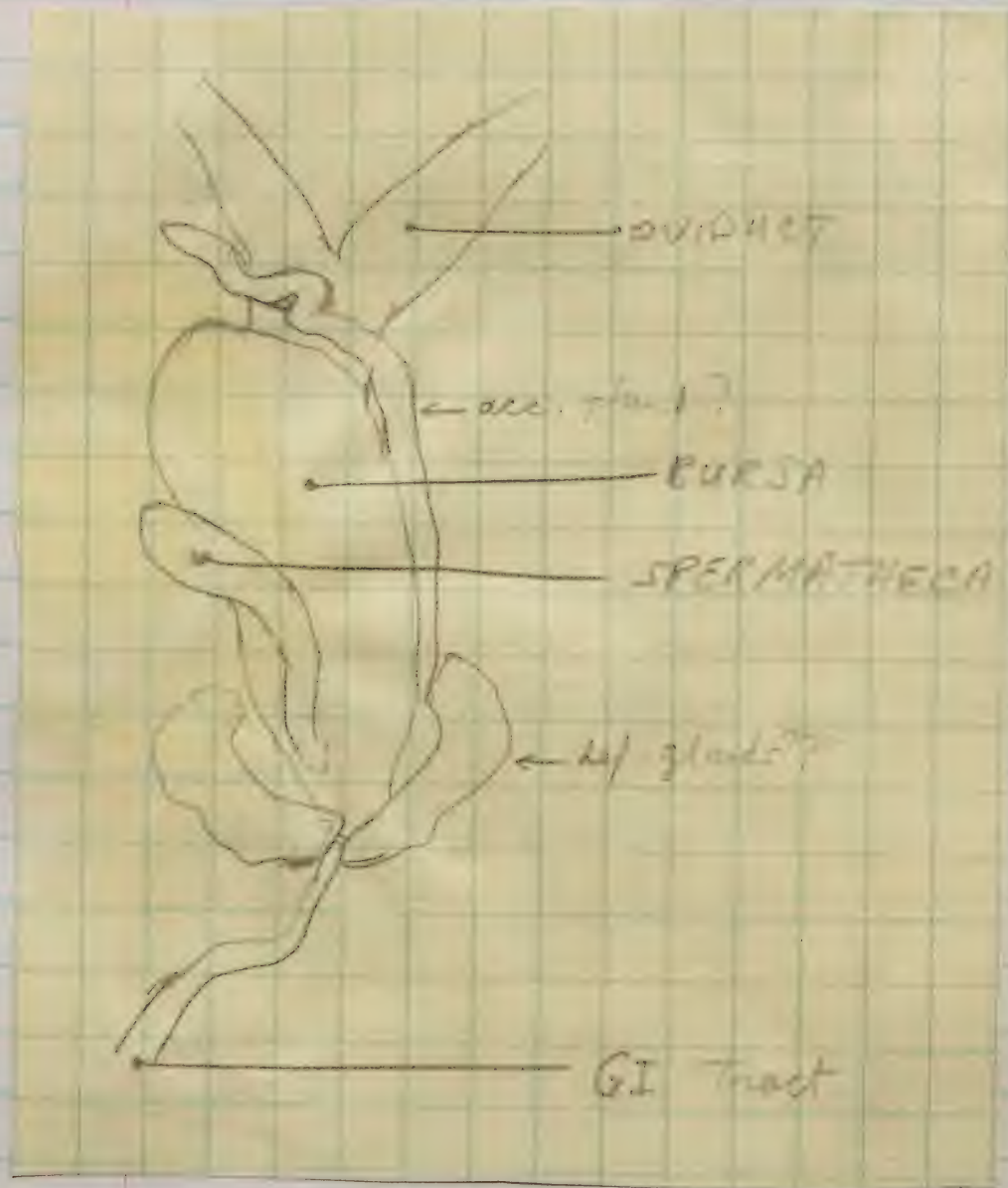


38

42

24 Sept 1967

Chauliognathus ♀ genital system.  
coll. Portal Road.





54

42 ps

26 Sept. 1967

CHAULIOGNATHUS PRONOTAL PATCH

13:05

4 Chauliognathus, 3 ♀♀ and 1 ♂, ~~collected~~  
(coll. viz. Portal-Bader Rd 24 Sept '67  
by sweeping from car, R.S.) were placed  
on goldenrod under a net bag closed  
w/ a string. All 3 ♀♀ had  
distinct pronotal patches.



39

## SUMMARY OF EXPERIMENTS WITH CHRYSOPID LARVAE

Arizona, 1967

R. Silberglied

VERSUS ARMY ANTS (*Neivamyrmex* sp.)

2 fluffpuffs, 1 naked, 1 with fluff, were placed in trail of ants in a plastic cassette. Naked one ~~was~~ stung; immobile in 5 minutes. One with fluff alive and moving 1 hr & 10 min. later.

Same experiment repeated. After 18 min. the naked one is on its back, stung and immobile. One with fluff alive & moving.

## PREY OF LEAF-NESTING SPIDERS FOUND IN WEBS (NATURAL)

8-1-67

39

54

## SPIDERS VERSUS CHRYSOPID LARVAE

## 12 cassettes set up as

1	leaf web	we
2	leaf web	we
3	leaf web	we
4	leaf web	we
5	no web	we
6	no web	we
7	no web	ru
8	no web	ru
9	leaf web	we
10	leaf web	we
11	leaf web	we
12	leaf web	we

## Cumulated data:

	alive
WITH FLUFF	1
NO FLUFF	2

## VERSUS A WHIPSCORPION

Small whipsorpion (about 17  
found petri dish with naked  
naked larva found dead on box  
because of crumpled nature of

Same whipsorpion placed in  
Whipsorpion observed to attack  
the moving larva with its pedipalps  
cheliceræ. Each time the fluff  
later remains of larva's fluff  
it was eaten.

39

39



39

## SUMMARY OF EXPERIMENTS WITH CHRYSOPID LARVAE

Arizona, 1967

R. Silberglied

VERSUS ARMY ANTS (*Neivamyrmex* sp.)

2 fluffpuffs, 1 naked, 1 with fluff, were placed in trail of ants in a plastic cassette. Naked one ~~was~~ and stung; immobile in 5 minutes. One with fluff alive and moving 1 hr & 10 min. later.

Same experiment repeated. After 18 min. the naked one is on its back, stung and immobile. One with fluff alive & moving.

## PREY OF LEAF-NESTING SPIDERS FOUND IN WEBS (NATURAL)

"Yellow running spider": nests bare except for mites, cicadellids (alive), and cicadellid exuviae

"Marked, leaf nesting spider": "Sycamore-fluff" found in webs, plus: -Arthropods found in webs included:

Cecidomyiid flies  
Staphylinid beetles  
Mites  
Cicadellid bugs  
Tingid bugs  
Chalcidoid Hymenopterans  
Trichogrammatid wasp  
Muscid flies  
Calliphorid fly

## IPSCORPION

hipscorpion (about 17  
petri dish with naked  
larva found dead on bo  
e of crumpled nature of

hipscorpion placed in  
orpion observed to atte  
oving larva with its ped  
cerae. Each time the flu  
remains of larva's fluf  
s eaten.

## SPIDERS VERSUS CHRYSOPID LARVAE

12 cassettes set up as

1	leaf web	we
	web	we
	web	we
	web	we
	web	we
	web	we
	web	we
	web	we
	web	we
	web	we
	web	we

ed data:

alive

FLUFF

1

FLUFF

2

39

39



39

## SUMMARY OF EXPERIMENTS WITH CHRYSOPID LARVAE

Arizona, 1967

R. Silberglied

VERSUS ARMY ANTS (*Nelivamyrmex* sp.)

2 fluffpuffs, 1 naked, 1 with fluff, were placed in trail of ants in a plastic cassette. Naked one ~~was~~ <sup>was</sup> stung; immobile in 5 minutes. One with fluff alive and moving 1 hr & 10 min. later.

Same experiment repeated. After 18 min. the naked one is on its back, stung and immobile. One with fluff alive & moving.

## PREY OF LEAF-NESTING SPIDERS FOUND IN WEBS (NATURAL)

87-11

## SPIDERS VERSUS CHRYSOPID LARVAE

## 12 cassettes set up as follows:

1	leaf web	web-spinner	2	larvae with fluff
2	leaf web	web-spinner	2	larvae with fluff
3	leaf web	web-spinner	2	larvae; no fluff
4	leaf web	web-spinner	2	larvae; no fluff
5	no web	web-spinner	1	larva with fluff
6	no web	web-spinner	1	larva; no fluff
7	no web	running spider	1	larva with fluff
8	no web	running spider	1	larva; no fluff
9	leaf web	web-spinner	2	larvae with fluff
10	leaf web	web-spinner	2	larvae with fluff
11	leaf web	web-spinner	2	larvae; no fluff
12	leaf web	web-spinner	2	larvae; no fluff

## Cumulated data:

	Alive alive & moving	pupated	Dead sucked dry	not eaten
WITH FLUFF	1	4	4	1
NO FLUFF	2	3	3	2

## VERSUS A WHIPSCORPION

Small whipscorpion (about 17 mm, not incl. whip), placed in small round petri dish with naked Chrysopid larva. 14 hr., 45 min. later naked larva found dead on bottom of petri dish, assumed eaten or killed because of crumpled nature of skin.

Same whipscorpion placed in cassette with fully fluffed larva. Whipscorpion observed to attack larva 4 times, each time grabbing the moving larva with its pedipalps and pulling it in towards its chelicerae. Each time the fluffpuff was released alive. 24 hr., 25 min. later remains of larva's fluff found in cassette; no larva. Assumed it was eaten.

## Result:

Both pupated  
Both dead, sucked dry  
One dead & sucked dry,  
other pupated  
Both dead, but not eaten  
Dead, sucked dry  
Dead, sucked dry  
Dead, not eaten  
Pupated  
One alive, other pupated  
Both pupated  
Both alive  
One dead & sucked dry,  
other pupated.



43

PE

43

Selenops

Actophilus  
(WALL SPIDER) Ch.

Olios Fasciculatus

(GIANT CRAB SPIDER)  
5 mm

Misumena

Ferrugipes

Thomis

Thomis

Lysanthes  
Ch + I



EH

1. Label ARIZONA Material
2. Elaterid paper
3. "seminar" - get refs. on facid exp.
4. Periplaneta
  1. set up smaller cages by 'days after moulting'
  2. morphology - try chinazol black to find more sensitive areas
    - a. describe surfaces
    - b. look at sensilla
  3. pain = det ① heat (temp) (needle?) temp det?
    - ② kinds of substances
    - ③ concentration
    - ④ application methods
    - ⑤ # responses / AREA

STATISTICAL STUDY

4. describe all cleaning reflexes

Biol. Note 16 (Gnathoda) Parasite.

Exp. Nos. WITHOUT SPECIMENS:

283. Papilionids (Aristolochia) caterpillars.
- 286 Caterpillar vs. centipede
- 288 Elaterid vs "
- 289 " vs solpugid
- 290 Brachystola - tibial spurs (specimen, not #s)
- 292 State Line Road QUEEN.
- 294 Queen hair pencil secretion
- ~~296 Pental Reductus Ms. Material~~
297. Pasyrnachus (CCR)
- 298 " vs elaterid
- 299 Triatoma? (CCR-UV) vs elaterid

OVER



39

Chrysopid 468 = Chrysopa perfecta Banks  
 Specimens held by Ellis McLeod  
 Other eggs are Zomomyia sp.  
 ref in Psyche 6

39

26 Sept.

SPIDERS vs. CHRYSOPID LARVAE

CONTINUED FROM p. 31-35

16:25

4 Cassettes set up as follows:

39

- (1) all cassettes have one spider in leaf web
- (2) First 2 cassettes have 2 larvae, with fluff, in each (#9, 10)  
 Second 2 cassettes (#11, 12) have 2 larvae, without fluff (naked) in each.

9	} 2 larvae ea. + fluff	} web spinning spider +
10		
11	} 2 larvae ea, naked	} leaf nest.
12		



26 Sept  
9

LEAF NESTER w/ LEAF NEST  
vs 2 FLUFFY LARVAE

16:25

START

21:40

NO ACTION. 2 FLUFFS FREE + MOVING.  
SPIDER IN RETREAT

27 Sept.

12:48

SPIDER IN RETREAT. BOTH FLUFFPUFFS  
ALIVE + MOVING. ONE IS UNDER  
SILK STRANDS OF WEB AND HAS  
LEFT TRAILS OF FLUFF.

29 SEPT

1:09

SPIDER HAS NEW RETREAT ON SIDE OF  
CASETTE; ONE LARVA HAS PUPATED  
IN WEB; OTHER HAS LOST FLUFF  
AND IS SUSPENDED IN WEB IN MIDAIR.

2 OCT

3:41

SAME AS 29 SEPT. ONE LARVA  
STILL ALIVE <sup>+ MOVING</sup>  
(other pupated) TERMINATED

LEAF NESTER w/ LEAF NEST  
vs 2 FLUFFY LARVAE

10

26 Sept

START

16:25

21:45

NO ACTION. SPIDER IN RETREAT. 2  
LARVAE FREE + MOVING.

27 Sept

12:49

BOTH LARVAE ALIVE + MOVING;  
SOME FLUFF SEEMS TO HAVE  
BEEN LOST IN WEB THAT WAS  
FRESHLY SPUN BETWEEN LEAF  
AND CASETTE. SPIDER IN RETREAT.

29 SEPT.

1:17

ONE LARVA PUPATED IN WEB; OTHER  
- ALIVE + MOVING ON LEAF. SPIDER IN  
RETREAT

2 OCT

3:43

BOTH LARVAE NOW PUPATED.  
SPIDER IN RETREAT  
TERMINATED

39



(11)

LEAF NESTER w/ LEAF NEST  
vs 2 NAKED LARVAE

26 Sept

16:25

START

21:48

NO ACTION. SPIDER HAS LEFT  
RETREAT. BOTH LARVAE ALIVE &  
MOVING; SOME FLUFF REMOVED  
THAT THEY ACCUMULATED

27 Sept

12:51

SPIDER HAD BUILT NEW RETREAT  
ON TOP OF CASSETTE; DESTROYED  
WHEN CASSETTE OPENED. BOTH LARVAE  
ALIVE & MOVING, I REMOVED THEIR  
ACCUMULATED FLUFF.

29 SEPT.

1:20

SAME AS ABOVE; RETREAT DESTROYED,  
BOTH LARVAE ALIVE; FLUFF REMOVED.

2 OCT

3:44

BOTH LARVAE ALIVE & MOVING,  
SPIDER IN RETREAT  
TERMINATED

(12)

LEAF NESTER w/ LEAF NEST  
vs 2 NAKED LARVAE

26 Sept.

16:25

START

21:49.

SPIDER IN RETREAT. CHRYSOPIDS  
ARE (1) BELOW SHEET OF WEB,  
WHERE IT IS LOADING ~~W~~ FLUFF  
AND CICADELLID NYMPHAL SKINS, AND  
(2) ON SIDE OF CASSETTE WITH ACCUM-  
ULATED FLUFF. I REMOVED ALL  
ACCUMULATED FLUFF.

27 Sept.

12:54

SPIDER IN RETREAT. BOTH  
LARVAE ALIVE & MOVING.

29 SEPT

1:23

SAME AS BEFORE; BOTH LARVAE ALIVE  
& MOVING; FLUFF REMOVED; SPIDER IN  
RETREAT.

2 OCT

3:45

~~BOTH~~ ONE LARVA PUPATED -  
THE OTHER DEAD ON BOTTOM  
OF CASSETTE & APPARENTLY  
SUCKED DRY. TERMINATED

39



39

CUMULATED SPIDER DATA. 28 SEPT.

WITH

FLUFF (10)

#  
1 4 4 1

WITHOUT

FLUFF (10)

# # # #  
2 3 3 2

ALIVE +  
MOVING

PUPATED

EATEN  
~~BY SPIDER~~

NOT  
EATEN

ALIVE

DEAD

43

NAMES OF INSECTS OF PORTAL AREA  
TO BE CHECKED AGAINST THOSE  
COLLECTED AND LARGE COLLECTIONS.

ORTHOPTERA:

Bright colored ACRIDID: Dactalotum variegatum

Crested green ACRIDID: Trapidolophus formosus

Taeniopoda is eques

Brachystola is magna

Giant TETTIGONIID: Capnobates fuliginosus

Small Desert TETTIGONIID: Dichopetala brevihastata

COLEOPTERA:

Bright Desert ~~Teneb~~ CLERID: Trichodes horni

Smooth, margined TENEB: Euschides rimatus ~~stenomorphus~~

Rough, margined TENEB: E. sp.

Freezing or Running TENEB: Pelecyphorus morbillosus

Hemispherical TENEB: Discoderus reticulatus — Euschides

Pepsis-mimic CERAMBYCID: Tragidion sp.

Chauliognathus mimicing CERAMBYCIDS:

Tylosus maculatus

Crossidius pulchellus

Tetraopes femoratus [BIG + RED]

Tetraopes discoidens [GRAY]

see also: Anoplodera spp.

MISCELLANEOUS:

TABANID @ UUBL sheet: Tabanus dorsifer

REDUVID that feeds [DET. A. STONE]

on Chrysopid Larvae: Pselliopus

Big Red (sticky) REDUVID: Apiomerus

HYMENOPTERA - BUSH = BACCHARIS.

Courtesy A.M.N.H. ref. colln.

@ S.W. Res. Sta.; in particular,

courtesy Vince Roth.

ALSO: Large black + red meloid = ~~Pezomachus~~ Megestra

cancellata championi VanDyke

Black meloid that mimics (?) freezing TENEB:

Epicauta corvina Clec.



43

41



*Impatiens patens* (L.) Mill.







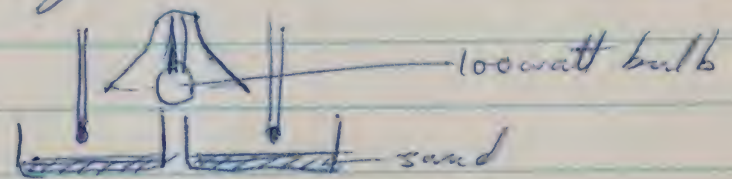


1A

12 Dec. 1967.

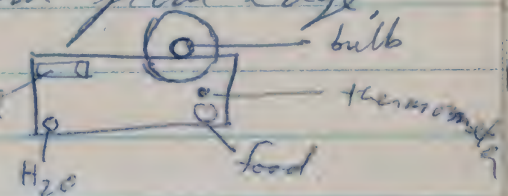
20:32

Two identical cages set up with  $\frac{1}{2}$ " to  $3\frac{1}{2}$ " sand; Pabulum mixed cereal on a small Petri dish cover; one large 12-dram vial, clean and without top; and test tube of distilled water with sponge tip, inverted and hung from side of cage. Cages are 8x12 white plastic. ~~100~~ 100 watt bulb shines on both cages and its light & heat are evenly divided between them.



Thermometers in both cages, 1 cm above sand and 40 cm from edge, records temp. °C.

p. 46 has temperatures recorded





42

45

Date	Time	°C	°F	Comments	Date	Time	°C	°F	Comments
		R/L	R/L				R/L	R/L	
12 Dec	17:45	31/31	88	turned on 9:45					
12 Dec	20:32	35/35	94	steady					
13 Dec	1:30	39/35	94	"					
13 Dec	15:00	35/35	94	"					
14 Dec	00:34	35/35	94	"					



24

45

12 Dec.

Two beetles added to each cage, 2 ea.

20:32

R has normal Eleodes longicollis,L has 2 Eleodes longicollis that had  
their elytra removed on 8 Dec. 1967.

Until this time they have been in a cage  
with "normal" Eleodes longicollis, and,  
although not observed continually, showed  
no obvious differences in behavior  
from the "normals". They would mate  
& be mated, etc.



LYCIDS

44

8 Feb 1968

9:45 AM

I have had 8 larvae of *Lygids* that I kept since Arizona, in ~~Sept~~ Sept 1967, when they were collected. All were found vic. Cave Creek on Cave Creek Ranch, along the stream bed.

Emergences:

		<u>pupated</u>	<u>emerged</u>	<u>died</u>
1	♂	late Dec.	early Jan	late Jan
1	♂	<del>late Jan</del>	early Feb	15 Feb
1	♂	before 5 Feb	18 Feb '68	
1	♀	{ betw. 12 midnight and 9:45 AM, Feb 7-8 }	23 Feb '68	
1	♀	{ betw. 12 midnight and 10:30 AM, Feb 18-19 }	{ 3 Mar '68 ~ 8 PM }	{ Mar '68 (killed) }
1	♀	6-7 March 1968	10-12 Mar '68	

1 ♂ 10-12 Mar 1968

1 ♂ 10-12 Mar 1968

1 ♀? 12-14 Mar 1968 20 Mar '68



31 March 1968  
~~April~~

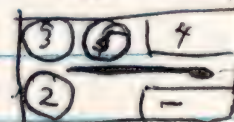
# EXPT. #45

Experiment to test hypothesis: Does the presence or absence of elytra on the backs of Tenebrionid beetles confer any survival advantage under hot, or dry, or both, conditions

## Materials.

45 Eleodes sp.?, second generation, all progeny of Eleodes sp.?, collected at Cave Cr. Ranch, v.c. Patal, Arizona, Sept. 1967; progeny all emerged within 5 days of one another; larvae were reared in same containers and underwent same cooling period to break diapause. All now about 1 month old.

5 containers, 3 round, 2 square, all filled w/ about  $\frac{3}{4}$  inch of sand.



thermometer

1 large container holding above containers, and thermometer

1 thermometer  $^{\circ}\text{C} = -10 \text{ to } 150$ .



2A

# Method

45

Adults prepared by

(1) pinning down on protein block,  
venter up

(2) cutting around as follows

1. elytra cut off

2. elytra cut off + replaced, cemented

3. elytra cut around but not off

4. elytra intact

5. elytra w/ hole cut in top,  
~1 cm in diam.

~~② Beetles put into containers,  
apiece~~

③ Beetles rinsed w/ distilled H<sub>2</sub>O

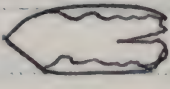

④ Beetles put into containers,  
one apiece



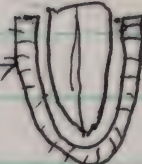
31 Mar.  
17:00 hr.

45

- #1. placed <sup>and pinned</sup> on back, elytra cut around;  
turned over on belly to remove.  
beetle washed, put in container;  
beetle discharged quinine during operation.
- #2 placed + pinned on back; elytra cut  
around, turned over on venter to  
remove <sup>the elytra</sup> in one piece; elytra soft  
at humeri and curled over;

fural cement applied   
to all edges except apex, placed  
on beetle affixed to cork,   
cement fused all around,  
except apex (last 2 sternites)  
w/ hot needle. beetle washed,  
put in container. beetle discharged  
during operation; it also injured  
right prothoracic leg @ fibro-femoral  
joint.

- #3 placed + pinned on side on protein  
block, left side cut; right side  
done in hand, beetle cut all  
around except @ base

beetle washed +   
placed in cassette.  
beetle discharged quinine during  
operation.



#4. beetle pinned down on venter,  
left under light; then on dorsum,  
left under light; washed off  
and placed in container.  
Beetle has tibia of left metathoracic  
leg broken w/ distal part missing,  
also has same for left mesothoracic  
leg's tarsus. Beetle did not discharge  
quinones although (tried to make it do so).

#5 beetle pinned on venter and  
1 cm diam hole cut in dorsum  
of elytra. beetle washed and  
put into container. Beetle discharged  
quinones while being washed

→ Squeezed legs w/ forceps  
opened oper of abd. w/ forceps

31 Mar. (800 hr. — large container put  
under gooseneck lamp.



21

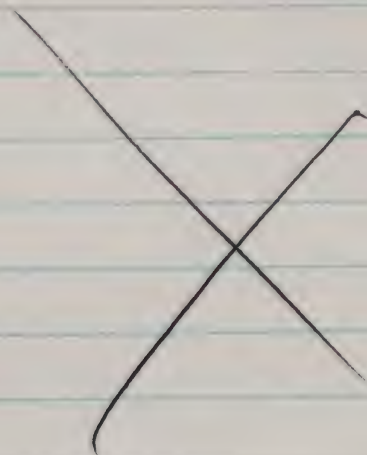
45

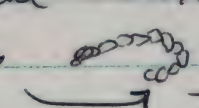
date	time	temp °C	°F
31 Mar	18:00	25	76
	19:00	30	86
	20:00	32	90
1 April	10:00	32	90
	20:00	32	90
2 April	17:00	32	90
3 April	10:30	32	90
4 April	11:50	31	87
	22:35	30	86
5 April	23:10	31	87
8 April	10:55	32°	90
9 April	10:45	33°	
11 April	12:50	34°	

DEAD

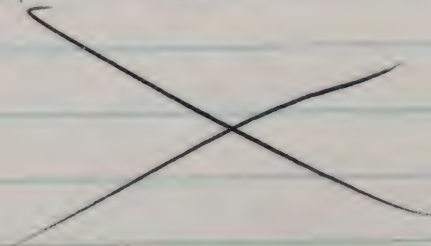


- #1 1 April 20:00 alive and O.K.  
2 April 17:00 dead, tissues shrunken



- #2 1 April 20:00 alive and O.K.  
2 April 17:00 alive & O.K.  
3 April 10:30 alive & O.K.  
4 April 00:20 alive & O.K.,  
right foreleg seems crippled,  
doesn't bend at femur-tibia joint.  
22:35 alive, sluggish,  
antennae curled under at  
apices 

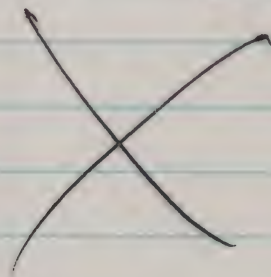
5 April 23:00 dead





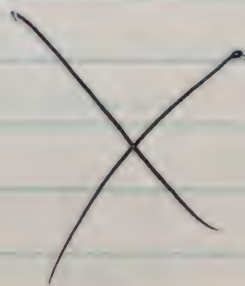
#3

- 1 April, 12:00. on back, legs and antennae shaking and quivering  
 1 April, 20:00 still on back & quivering  
 2 April 17:00 dead, on back



#4

- 1 April 20:00 alive and O.K. (fizziness)  
 2 April, 17:00 dead, dried out



#5

- 1 April 20:00 alive and O.K.  
 2 April 17:00 alive and O.K.  
 3 April 10:30 alive and O.K.  
 4 April 00:20 alive and O.K. covered w/ sand particles on pronotum and elytra  
 4 Apr, 11:50 alive and O.K.  
 4 Apr. 22:35 alive and O.K.  
 5 Apr. 23:10 alive & O.K.  
 9 April 23:45 dead



I 0 6 12 18  
 II 0 6 12 18  
 III 0 6 12 18  
 IV 0 6 12 18  
 V 0 6 12 18  
 VI 0 6 12 18

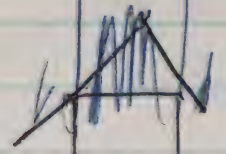
① ELYTRA REMOVED

② ELYTRA REMOVED, REPLACED + SEALED

③ ELYTRA CUT AT SIDES

④ ELYTRA IN CONTACT

⑤ ALL 13 TO 3744 ELYTRA





EXPT # 46

3 April 1968

15:00

4 *Eledes* spp. from San Agustín Pass, N. Mex., 3 Oct. 1967 (— R.S.), were prepared as follows.

Each beetle was fitted with a number (#1, 2, 3, 4) glued on the dorsum of the prothorax with feral cement, using a hot needle.

~~Beetles were~~

Beetle #1 — elytra intact

~~Beetle #2 — elytra removed~~

Beetle #2 — ~~elytra~~ hole made in elytra about 3 mm. in diameter

Beetle #3 — same as no. 2, but piece of elytron glued ~~to~~ over ~~to~~ the hole with feral cement.

Beetle #4 — same as no. 2 but piece of transparent plastic glued in place with feral cement.

Beetles put into container they came from after being washed w/ distilled water.



2A

46

21:00 put all beetles into cassettes ~~in~~  
~~a thin~~ (6.7 x 6.7 x 12.5 cm)  
 (clear plastic) w/ < 1 cm sand in  
 bottom and small card for shade  
 in a large plastic box  
 approx 10" x 13" x 4". Each beetle  
 weighed (see next page) <sup>(p. 60)</sup> Thermometer  
 added and put under a 60 watt  
 incandescent lamp in a goose-neck  
 base, ~ 2 cm from top of case

3 April	23:00	27°C	(80°F)
4 April	00:30	36°C	(96°F)

moved lamp to 3.5 cm from top of  
 case

4 April	10:30	36°	(96°F)
---------	-------	-----	--------

~~moved lamp to 8 cm from top of box~~

4 April

~~removed box for weighing~~  
 (see 2 pages after this) (p 61)  
 temperature during weighing  
 11:00 24.5°C ( °F)

11:50 put back under lamp,  
 (60 w) at 8 cm betw/ box and lamp.  
 12:30 33 °C ( 91 °F)  
 12:40 35 °C ( 95 °F) <sup>cont to p 63</sup>



24

46

3 APRIL  
20:00

Weights of beetles at beginning of test.

608  
- 641  
---  
44  
606  
- 42  
---

tare	1	tare	2
5.64133	6.08834	5.64158	6.02667
5.64136	6.08834	5.64169	6.02662
5.64137	6.08832	5.64163	6.02660
5.64137	6.08833	5.64168	6.02662
5.64139	6.08831	5.64164	6.02656
(28.20682)	(30.44164)	(28.20822)	(30.13307)

tare	3	tare	4
5.64252	6.11707	5.64309	6.02178
5.64247	6.11702	5.64310	6.02179
5.64253	6.11696	5.64303	6.02172
5.64245	6.11690	5.64302	6.02171
5.64250	6.11692	5.64304	6.02168
(28.21247)	(30.58487)	(28.21528)	(30.10868)

tare  
5.64282  
5.64281  
5.64291  
5.64302  
5.64298  
(28.21454)



2A

46

4 APRIL

11:00

<u>tare</u>	<u>1</u>	<u>tare</u>	<u>2</u>
<del>5.64206</del>	6.06243	5.64252	5.98941
<del>5.64214</del>	6.06236	5.64248	5.98943
<del>5.64219</del>	6.06238	5.64247	5.98941
<del>5.64218</del>	6.06234	5.64243	5.98940
5.64256	6.06235	5.64248	5.98935
5.64252	(30.31186)	(28.21238)	(29.94700)
5.64253			
5.64254			
5.64257			
(28.21272)			

<u>tare</u>	<u>3</u>	<u>tare</u>	<u>4</u>
5.64255	6.08704	5.64320	5.99232
5.64256	6.08701	5.64318	5.99232
5.64259	6.08698	5.64315	5.99232
5.64271	6.08697	5.64310	5.99231
5.64266	6.08694	5.64308	5.99232
(28.21307)	(30.43494)	(28.21571)	(29.96159)

tare

5.64309  
 5.64307  
 5.64310  
 5.64309  
 5.64311  
 (28.21548)



24

46

4 April 22:35 33°C ( °F)  
23:15 30°C (86 °F)

23:15 removed for weighing, see p. 64  
23:55 back to light [at 24.5°C]  
23:55 24.5°C ( °F)

5 April ~~23:30~~ 23:30 33°C ( °F)  
removed and weighed, see p. 65

put back to light  
23:55 24.5°C ( °F)

8 April 10:55 34°C ( °F)

#2 and 3 are dead

removed and weighed @ 11:00.  
see p. 66.

put back to light  
12:30 25°C ( °F)

9 April 23:30 32°C ( °F)  
weighed, see p. 69. #4 dead. Put back at 1/2

10 April 00:05 24.5  
11 April 12:55 33°C ( °F)

weighed (12:20) all are now dead. terminated



24

46

4 April

23:20

lane

1

lane

2

<del>5.64131</del>	6.04773	5.64184	5.96269
<del>5.64139</del>	6.04776	5.64158	5.96272
<del>5.64146</del>	6.04784	5.64166	5.96275
<del>5.64152</del>	6.04791	5.64167	5.96276
5.64154	6.04792	5.64170	5.96270
5.64162	(30.23916)	(28.20815)	(29.81632)
5.64164			
5.64162			
5.64171			
(28.20813)			

lane

3

lane

4

5.64162	6.06526	5.64188	5.97239
5.64168	6.06528	5.64191	5.97240
5.64190	6.06534	5.64194	5.97252
5.64192	6.06535	5.64202	5.97256
5.64198	6.06543	5.64204	5.97258
(28.20910)	(30.32666)	(28.20979)	(29.86245)

lane

5.64188  
 5.64190  
 5.64196  
 5.64202  
 5.64204  
 (28.20980)



dt

46

5 April  
23:30

tare

1

tare

2

<del>5.64084</del>	6.01886	5.64099	5.92268
<del>5.64096</del>	6.01889	5.64106	5.92273
<del>5.64113</del>	6.01890	5.64107	5.92278
<del>5.64114</del>	6.01894	5.64112	5.92280
5.64121	6.01893	5.64117	5.92287
5.64123		(28.20541)	(29.61386)
5.64129	(30.09452)		

5.64135  
5.64138  
(28.20646)  
tare

3

tare

4

5.64187	6.02382	5.64210	5.94858
5.64190	6.02386	5.64218	5.94859
5.64195	6.02395	5.64221	5.94868
5.64198	6.02397	5.64225	5.94864
5.64206	6.02392	5.64228	5.94867
(28.20916)	(30.11952)	(28.21102)	(29.74316)

tare

5.64269  
5.64272  
5.64278  
5.64283  
5.64285  
(28.21387)



JA

46

8 April 1200.

fare

1

fare

(DEAD)  
2

5.64339	5.94903	5.64434	5.81348
5.64338	5.94901	5.64432	5.81348
5.64341	5.94901	5.64429	5.81346
5.64342	5.94900	5.64424	5.81354
5.64341	5.94902	5.64420	5.81353
(28.21701)	(29.74507)	(28.22139)	(29.06749)

fare (DEAD)  
3

fare 4

5.64419	5.89129	5.64414	5.86008
5.64419	5.89129	5.64410	5.86008
5.64423	5.89126	5.64413	5.86014
5.64420	5.89125	5.64412	5.86014
5.64420	5.89128	5.64411	5.86016
(28.22101)	(29.45637)	(28.22060)	(29.30060)

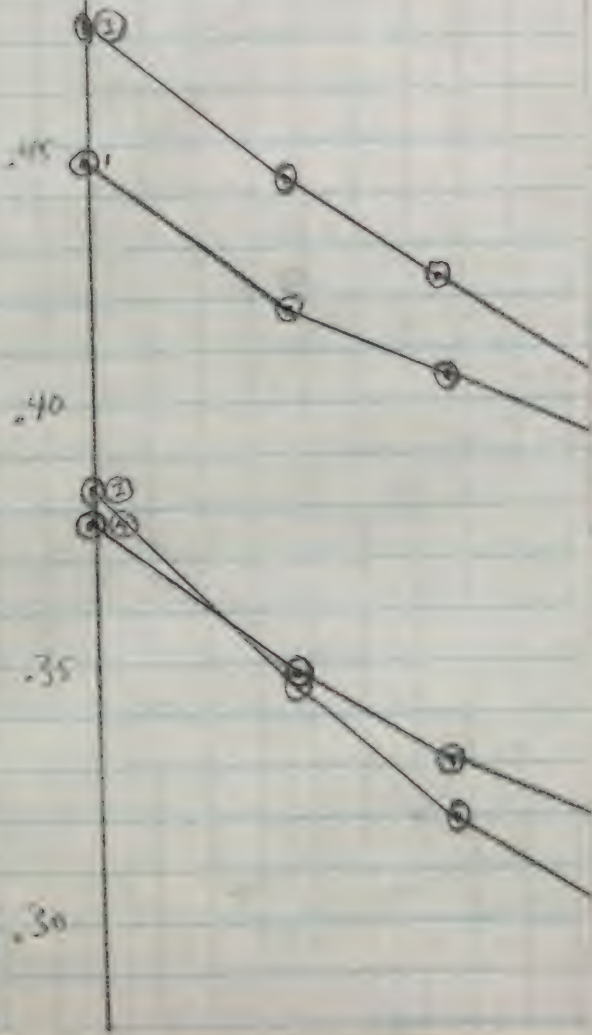
fare

5.64440  
5.64432  
5.64434  
5.64432  
5.64437  
(28.22175)



46

EIGHT IN GM.



46

		1	2	3	4
3 Apr. 20:00	weight (meas.)	6.08832 8	6.02661 4	6.11697 4	6.02173 6
	- tare (after)	5.64164 4	5.64279 4	5.64305 6	5.64290 8
	weight (beetle)	0.44668 4	0.38412 0	0.47391 8	0.37882 8

4 April	weight (meas.)	6.06237 2	5.98940 0	6.08698 8	5.99231 8
- 11:00	- tare (after)	5.64247 6	5.64261 4	5.64314 2	5.64309 2
	weight (beetle)	0.41989 6	0.34678 6	0.44384 6	0.34922 6
	$\Delta$ weight	0.02678 8	0.03733 4	0.03007 2	0.02960 2

4 April	weight (meas.)	6.04783 2	5.96272 4	6.06533 2	5.97249 0
23:20	- tare (after)	5.64163 0	5.64182 0	5.64195 8	5.64196 0
	weight (beetle)	0.40620 2	0.32090 4	0.42337 4	0.33053 0
	$\Delta$ weight	0.01369 4	0.02588 2	0.02047 2	0.01869 6

5 April	weight (meas.)	6.01890 4	5.92277 2	6.02390 4	5.94863 2
23:30	- tare (after)	5.64108 2	5.64195 2	5.64220 4	5.64277 4
	weight (beetle)	0.37782 2	0.28082 0	0.38170 0	0.30585 8
	$\Delta$ weight	0.02838 0	0.04008 4	0.04167 4	0.02467 2

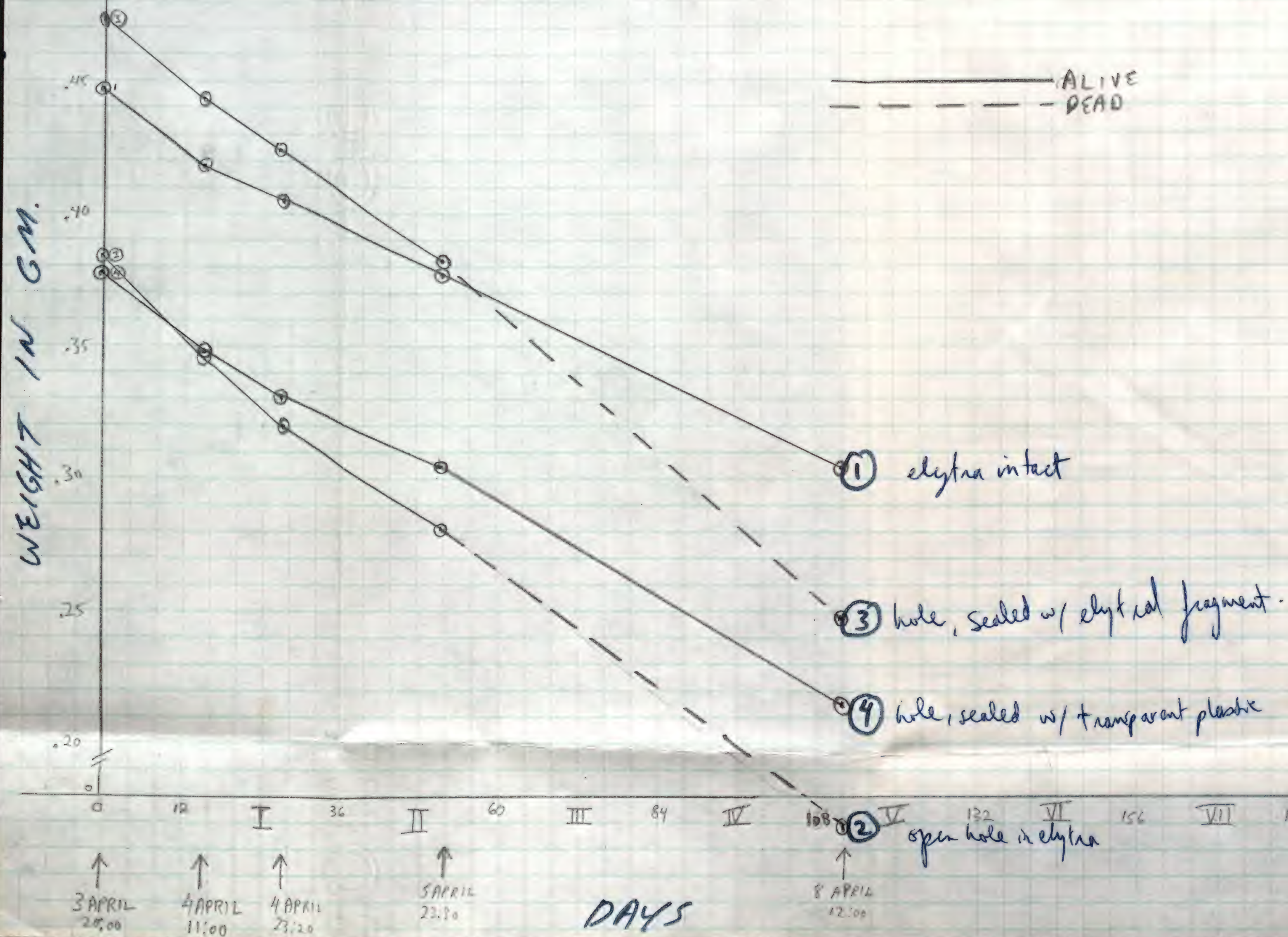
8 April	weight (meas.)	5.94901 4	5.81349 8	5.89127 4	5.86012 0
12:00	- tare (after)	5.64427 8	5.64420 2	5.64412 0	5.64435 0
	weight (beetle)	0.30482 6	0.16929 6	0.24715 4	0.21577 0
	$\Delta$ weight	0.07299 6	0.01152 4	0.13454 6	0.09008 8

9 April	weight (meas.)	.	.	.	.
2340	- tare (after)	.	.	.	.
	weight (beetle)	.	.	.	.
	$\Delta$ weight	.	.	.	.



46

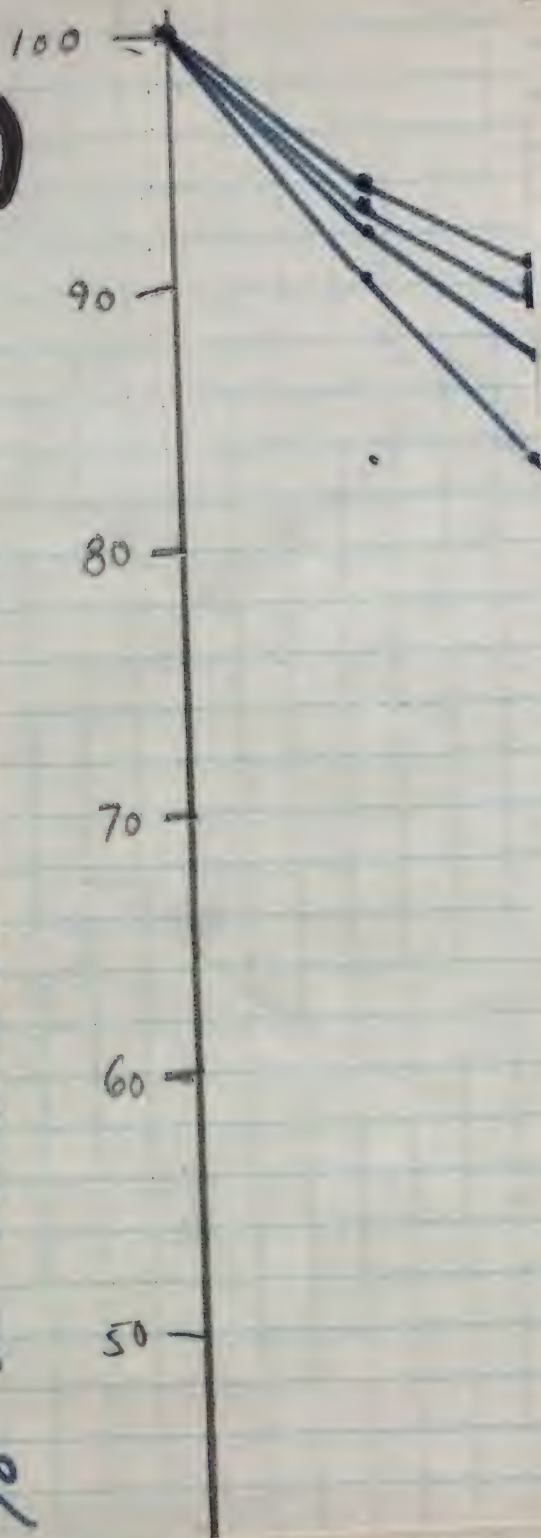
## ABSOLUTE WEIGHT LOSS





(46)

% OF ORIGINAL WEIGHT



plastic  
segment

Relative weight Loss **46**

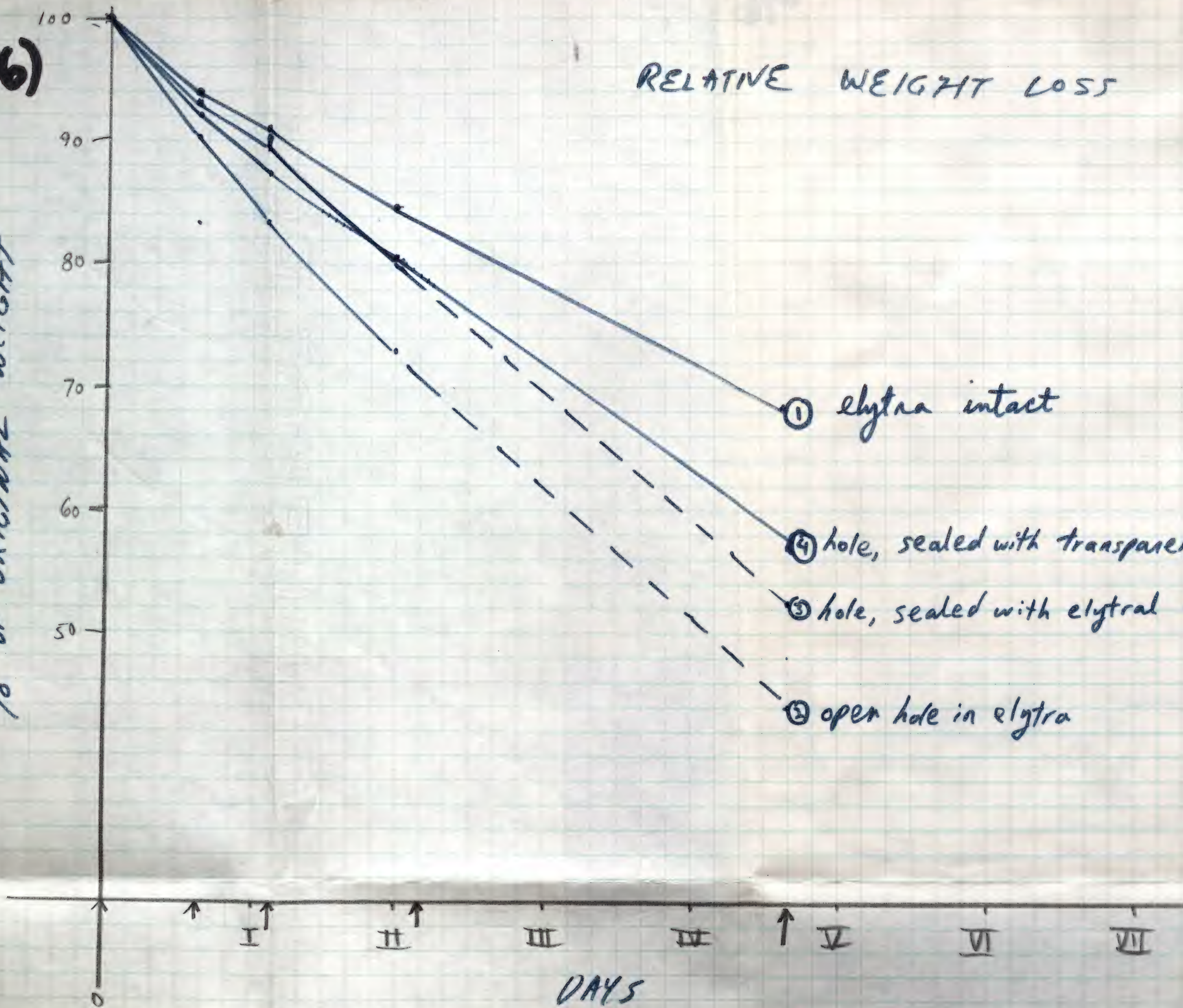
Date	1	2	3	4
3 Apr 20 <sup>00</sup>	100	100	100	100
4 Apr 11 <sup>00</sup>	94.0	90.2	93.6	92.1
4 Apr 23 <sup>20</sup>	90.9	83.5	89.3	87.2
5 Apr 23 <sup>20</sup>	84.5	73.1	80.5	80.7
8 Apr 12 <sup>00</sup>	68.2	(44.0)	(52.1)	56.9
9 Apr 23 <sup>40</sup>				



(46)

# RELATIVE WEIGHT LOSS

% OF ORIGINAL WEIGHT





9 April  
23.40

tare

1

46

tare

(DEAD)

2

5.64375

5.88876

5.64425

5.72989

5.64377

5.88877

5.64423

5.72989

5.64382

5.88877

5.64426

5.72990

5.64388

5.88872

5.64429

5.72995

5.64392

5.88880

5.64430

5.72999

( ) ( ) ( ) ( )

(DEAD)

tare

3

tare

(DEAD)

4

5.64426

5.78812

5.64438

5.80132

5.64426

5.78812

5.64434

5.80138

5.64429

5.78810

5.64434

5.80139

5.64426

5.78812

5.64434

5.80142

5.64431

5.78812

5.64436

5.80146

( ) ( ) ( ) ( )

tare

5.64318

5.64312

5.64309

5.64312

5.64311

( )



44

46

11 April

12:55

lane

1

lane

2

5.64119

5.81630

5.64224

5.71757

5.64130

5.81623

5.64231

5.71751

5.64137

5.81624

5.64228

5.71759

5.64138

5.81635

5.64234

5.71762

5.64142

5.81639

5.64238

5.71764

( ) ( ) ( ) ( )

lane

3

lane

4

5.64107

5.76006

5.64120

5.74235

5.64113

5.76003

5.64128

5.74230

5.64116

5.76005

5.64128

5.74227

5.64121

5.76005

5.64132

5.74226

5.64126

5.76011

5.64134

5.74228

( ) ( ) ( ) ( )

lane

5.64149

5.64148

5.64151

5.64154

5.64154

( )



40

(47)

35

30

25

 $t_c^{0.20}$ 

52/

00/

52

48

71

18 April 1968 16:00

Experiments with 2 *Staphylinids*, coll.  
v.e. Langmuir Lab 10 April 1968 R.S.  
being fed *Tribolium castaneum* & *confusum*,  
Synthetic wild types and MSG mutants. - LARVAE

*T. confusum* SYN. W.L.O.: offered, ate in 9 min,  
macerated in  $\frac{1}{2}$ , then ate head end. at  
tail it behaved like man with bone in throat,  
pushing at head with prothoracic legs, dropping  
food from mouthparts, wiping palps &  
mandibles in sand and w/ legs.

*T. confusum*, MSG mutant.



40

(47)

35

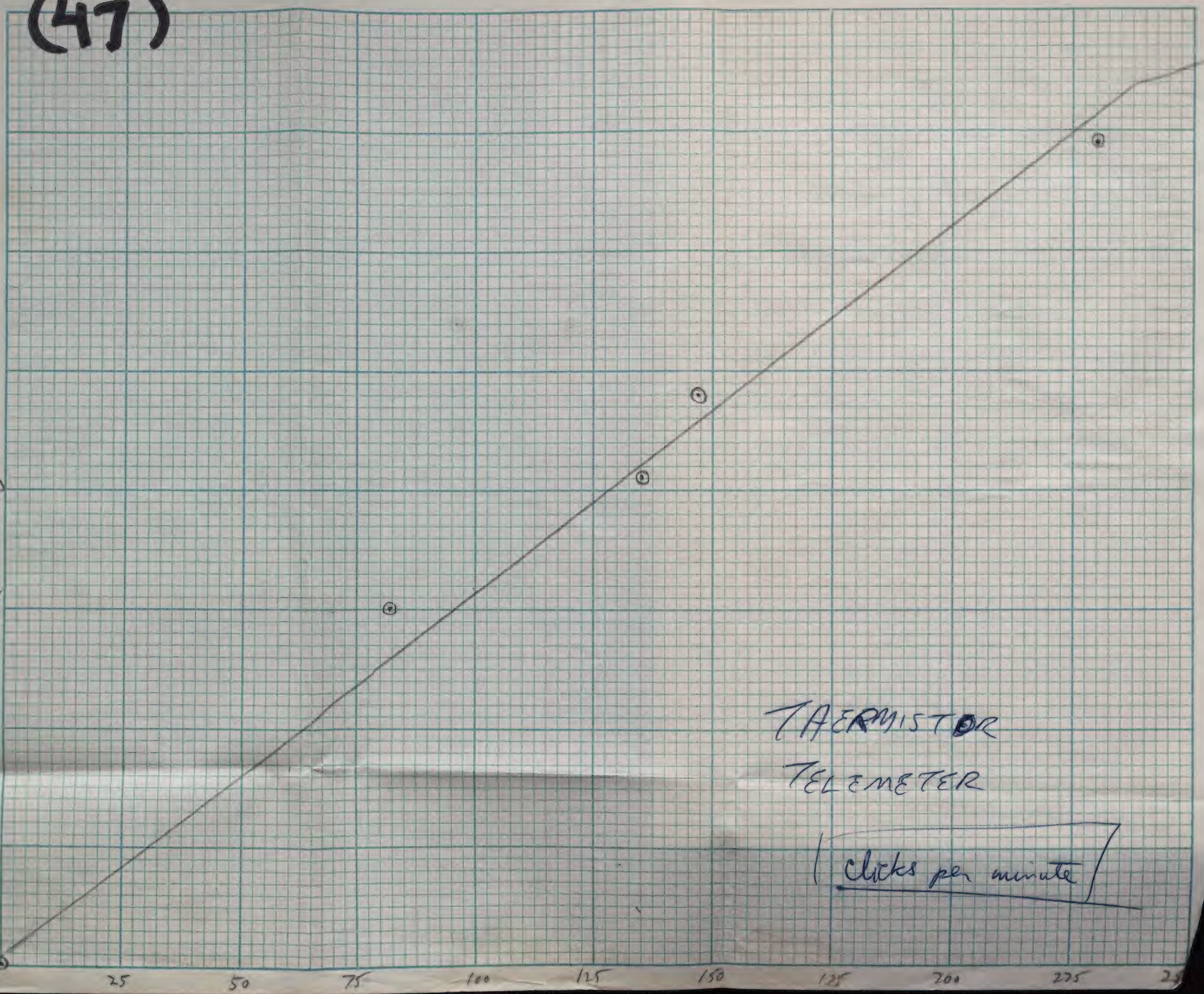
30

25

20  
10  
0

15

"THE EFFICIENCY LINE" NO. 10  
CROSS SECTION 10 SQUARES TO EACH



THERMISTOR  
TELEMETER

clicks per minute



84

40

35

30

20

10

MINIATURE  
PERSONAL ACCOUNT BOOKS  
for home and office



NO. 2044 OPEN STOCK  
in following rulings  
JOURNAL • CASH • S. E. LEDGER  
RECORD • D. E. LEDGER



NO. 2044-A ASSORTMENT  
consisting of  
3-JOURNAL 3-CASH 2-S. E. LEDGER  
2-RECORD 2-D. E. LEDGER



Made in U.S.A.



DICKMAN'S WAYFARER INN

ROLLA, MISSOURI

ROOM	RATE	DATE	AMT. PAID	RECEIVED BY
33	8.00	9-13-67	8.15	Kay

THIS IS YOUR RECEIPT

THANK YOU

Oct 5 1967

Received from Bob & Berghild

stay and 12 U. S. 20 MOTEL

7 MILES EAST OF GAR Dollars

PORTAGE, IND. Phone 762-7185

\$ 6.12 Richard McDonald

Made in U. S. A.



# DICKMAN'S WAYFARER INN

ROLLA, MISSOURI

ROOM	RATE	DATE	AMT. PAID	RECEIVED BY
33	5.00	9-13-67	5.15	Ray

THIS IS YOUR RECEIPT

THANK YOU

Oct 3 1967

Received from Bob Silberglied

Surp and 12 U. S. 20 MOTEL  
1.00 7 MILES EAST OF GAY<sup>190</sup> Dollars

PORTAGE, IND. Phone 762-7185

\$ 6.12 Richard McDonald

Made in U. S. A.



Go (1) Crown Motel, R. D. #1, Milan Ohio 9/12/67 \$5.20  
 Go (2) Dickman's Wayfarer Inn, Rolla, Mo. 9/13/67 5.15  
 Go (3) Casey's Corona Motel, Box 395, Corona, N.M. 10/3/67 4.25

Go (4) Guest House Motel Inc, [Ex 8.24] 9/14/67 2.74  
 Amarillo, Tex

Go (5) Ace Motel, [Ex 11.55] 9/15/67 3.66  
 Alamo, N.M.

Go (6) Brookshire Motel, Tulsa, OKLA 10/4/67 3.00

Go (7) US 20 motel, Portage, Ind. 10/5/67 3.00

16.10

6.49

7.46

24.00

54.05

274

375

649

17

51

2.50

17

1750

425

100.00

96.55

3.45

205

175

366

746

700

700

5405

425

425

27.00

720

890

649

746

200

800

700

700

700

700

700

700

700

700

3.75  
 14.00  
 48.00  
 4.50  
 7.46  
 6.49  
 8.90  
 7.20  
 100.30

515  
 375  
 890

9/12 5.20

9/13 5.15

9/14

9/15

9/16

9/17-10/2

10/3 4.25

10/4

10/5

10/6

375

425



## EDUCATION DEPARTMENT

CORNELL UNIVERSITY—STATE COLLEGES AND EXPERIMENT STATIONS

Voucher No.

State Agency:

Dept./Div. Code

Pay to:

Social Security No.

Payee Name ROBERT ELLIOT SILBERGLIED

Transportation Requests Used: Yes ☐ No ☐

Travel Order No. (s) _____	Official Station _____	Total Amount of this Voucher _____	_____
-------------------------------	---------------------------	---------------------------------------	-------

## STATE COMPTROLLER'S PRE-AUDIT

Title

By \_\_\_\_\_

[illegible]



STATE OF NEW YORK - TRAVEL VOUCHER  
EDUCATION DEPARTMENT  
CORNELL UNIVERSITY—STATE COLLEGES AND EXPERIMENT STATIONS

Voucher No.

State Agency:

Dept./Div. Code

Pay to:  
Payee Name **ROBERT ELLIOT SILBERGLIED**

Social Security No.

Transportation  
Requests Used: Yes ☐ No ☐

Date 19 <b>67</b>	ITEMS OF EXPENDITURE Specify Purpose of Travel	TIME		Transpor- tation Paid	SUBSISTENCE				Miscel- laneous	Sub. Vo. No.	TOTAL
		De- parture	Arrival		Break- fast	Lunch	Dinner	Room or Rm. & Bd.			
9/12	Bring totals from final T E V-3, sheet No. ....						2.00				
9/13					1.00	1.75	1.00	5.15			
9/14					1.00	1.00	1.75				
9/15					.75	1.00	2.00				
9/16					1.00	1.00	-				
9/17 - 10/2											
10/3					.50	1.25	2.00				
10/4					.75	1.00	2.25				
10/5					1.00	1.00	2.00				
10/6					.75	1.00	2.50				
TOTAL											

Travel Order  
No. (s)

Official Station

Total Amount of this Voucher

I, the claimant's superior, certify that this account has been examined and, to the best of my knowledge and belief, the amounts claimed therein were necessary for the performance of the claimant's authorized assignments.

MAJOR				FUNCTION	X	
MINOR	X			OBJECT	X	
DEPT.	X			SUB.		
ACCOUNT				PROJECT		

TRAVEL NOTICE NUMBER

Signature of Superior

ENCUMBRANCE LIQUIDATION \$

Title

EXPENDITURE CODES

Appropriation Identification Including Reappropriating Chapter/Sec./Laws				Fund	Dept.	Div.	Line	Original			Ch.	Obj.	Appropriation Charges
								Chap.	Sec.	Laws			

DUPLICATE



# STATE OF NEW YORK - TRAVEL VOUCHER

EDUCATION DEPARTMENT  
CORNELL UNIVERSITY—STATE COLLEGES AND EXPERIMENT STATIONS

Voucher No. \_\_\_\_\_

State Agency: \_\_\_\_\_

Dept./Div. Code \_\_\_\_\_

Pay to:

Social Security No. \_\_\_\_\_

Transportation  
Requests Used:

Yes ☐ No ☐

Payee Name

**ROBERT ELLIOT SILBERGLIED**

Date 19 <b>67</b>	ITEMS OF EXPENDITURE Specify Purpose of Travel	TIME		Transpor- tation Paid	SUBSISTENCE				Miscel- laneous	Sub. Vo. No.	TOTAL
		De- parture	Arrival		Break- fast	Lunch	Dinner	Room or Rm. & Bd.			
9/12	Bring totals from final T E V-3, sheet No. ....						2.00				
9/13					1.00	1.75	1.00	5.15			
9/14					1.00	1.00	1.75				
9/15					.75	1.00	2.00				
9/16					1.00	1.00	-				
9/17 - 10/2											
10/3					.50	1.25	2.00				
10/4					.75	1.00	2.25				
10/5					1.00	1.00	2.00				
10/6					.75	1.00	2.50				
TOTAL											

Travel Order No. (s) _____	Official Station _____	Total Amount of this Voucher _____
-------------------------------	---------------------------	---------------------------------------

## EMPLOYEE COPY

Employee—Retain this copy for your files.



